Military Vehicle Intelligence: Next Generation Electrical Architecture Infrared Microbolometer Night Vision Camera

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AC

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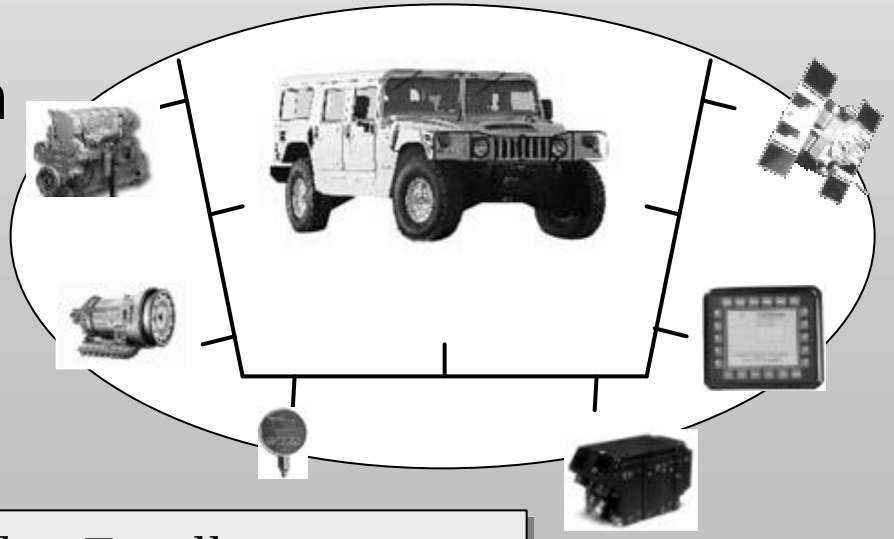
Next Generation Electrical Architecture (NGEA)

- **Purpose - To develop dual use electronic architecture that will realize greater functionality, reduced maintenance costs, and reduced development costs**

- **System Engineering Team**
  - **NAC**
  - **Oakland University**
  - **DaimlerChrysler**
  - **Lear Corporation**
  - **Eaton Corporation**



NGEA Description

- **Phase 1**: System Design - Utilize the System Engineering Process to develop a feasible NGEA design specification.
- **Phase 2**: Subsystem level design specification and on-vehicle diagnostic fault-over demonstration.
- **Phase 3**: Prototype development and complete System/Component specification. Tech demonstrator of finished NGEA on Jeep and HMMWV platforms.

NGEA Status

- Performance
  - Design specification complete to system level
  - Diagnostic fault-over demo complete
    - **Successfully displayed at Convergence conference Oct 1999 and 2001 SAE International symposium**
- Cost
  - **NAC/Industry Partners: $2.285 M/$2.265M**

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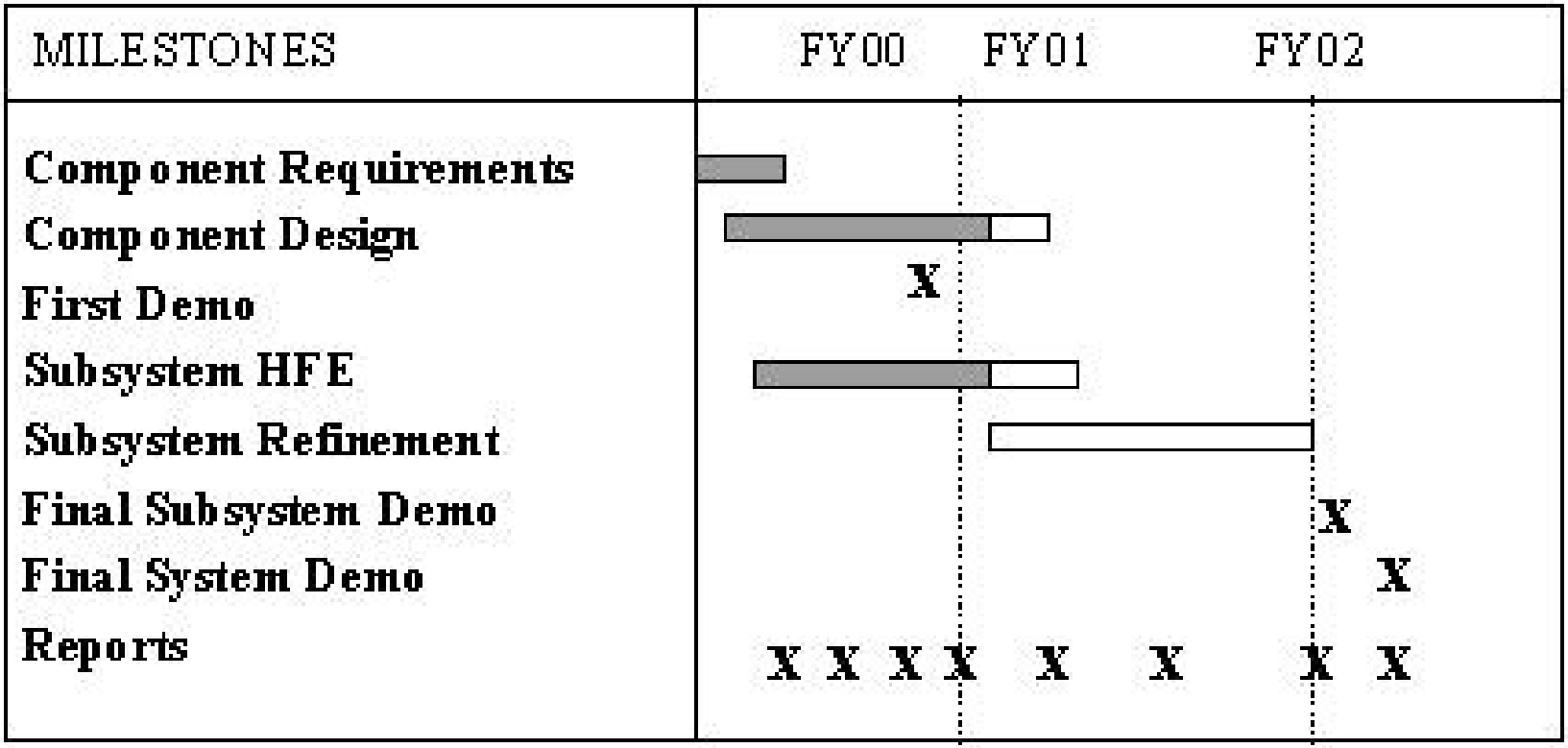
NGEA Schedule



Deliverables and ROI

- NGEA design specification and two demonstration vehicles - HMMWV and 1999 Jeep Cherokee
- Plug and play infrastructure for Army Trucks
- Reduction in O&S and commercial warranty cost (target $300/vehicle)
- Reduction in development costs (target $12M)
- No increase in piece costs

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NGEA Jeep at Convergence Show

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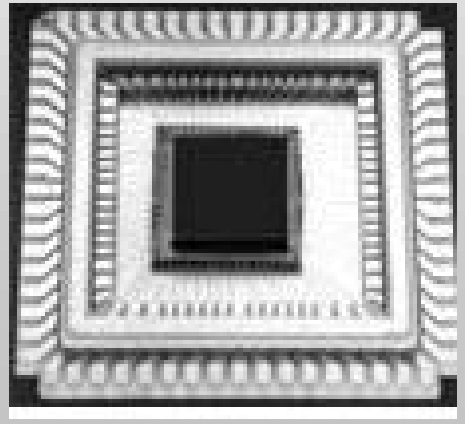
Infrared Microbolometer Night Vision Camera

- **NAC partnership with BAE Systems, Inc.**
- **Purpose**
  - **To Demonstrate low cost microbolometer thermal imaging device on NAC technology vehicle test bed demonstrator to validate low cost alternative to existing night vision devices**



Microbolometer Focal Plane Array

Project Description

- DUAP With BAE Systems (formerly Lockheed Martin) total value $2.8 M
- Objective - to design, develop, and fabricate a low power miniaturized uncooled microbolometer based thermal sensor
- Original program duration 21 months - 01/98 to 10/99

Technology Description

- Low power consumption (3.2 watts)
- Small space claim (3.5 in cube)
- 40x30 degree field of view
- Long-range super- sensitive microbolometer sensor
  - **Early uses include aviation applications**

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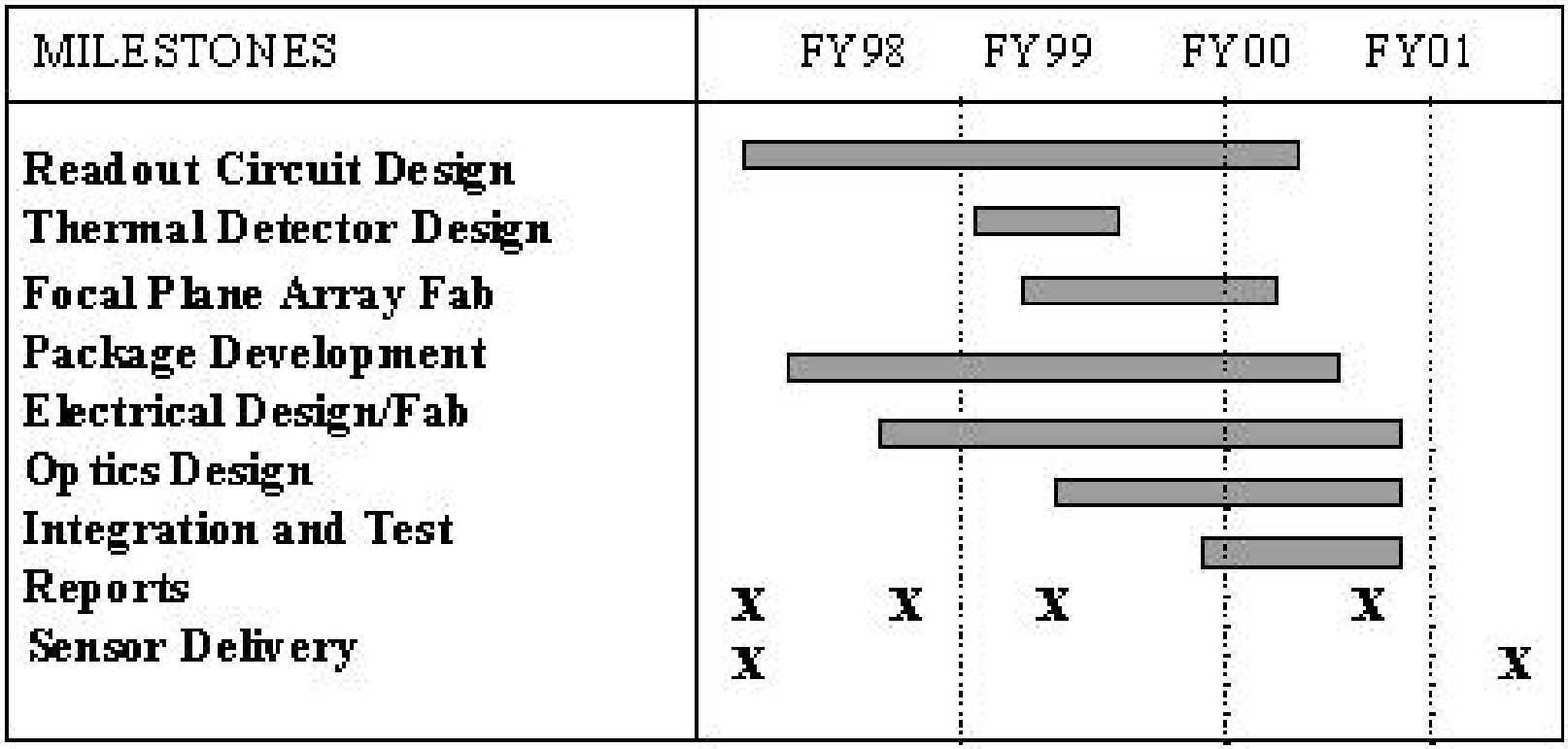
Microbolometer Schedule



Deliverables and ROI

- 3 Microbolometer sensors for application in Army ground vehicles
- Unit cost little as 1/5 of traditional tracked vehicle mounted systems ($7000-$10K).
- With additional development of electronics and optics, price of device could be reduced to the $2000-$5000.

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Microbolometer Application and Video